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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/402,260 09/30/99 KAWASHIMA

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EXAMINER

WILDER, C

ART UNIT

PAPER NUMBER

1655

DATE MAILED:

12/26/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.
09/402,260

Applicant(s)
Kawashima et al.

Examiner
CB Wilder

Group Art Unit
1655



☒ Responsive to communication(s) filed on Sep 19, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1, 2, 4-17, 21, and 23 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1, 2, 4-17, 21, and 23 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☒ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 11

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 1655

DETAILED ACTION

1. Applicants' amendment, filed September 19, 2000 (Paper No.10), is acknowledged. Claims 1, 2, 4, 6-9, 15, 17, and 21 has been amended. Claims 3 and 18 have been canceled. Claims 1, 2, 4-17, 21 and 23 are pending. The arguments have been thoroughly reviewed and are deemed moot in view of the new ground(s) of rejection. Any rejection not reiterated in this action have been withdrawn as being obviated by the amendment of the claims.

2. The text of those sections of Title 35, U. S. Code not included in this action can be found in a prior Office Action.

Previous Objections and Rejections

3. The claim objections directed to claims 1-17 are withdrawn in view of Applicant's amendment of the claims. The claim rejections under 35 U.S.C. 112 second paragraph directed to claims 1-17, 21 and 23 are withdrawn in view of Applicant's amendment of the claims. The prior art rejection under 35 U.S.C. 103(a) is withdrawn in view of new grounds of rejection.

New Grounds of Rejection

**THE FOLLOWING NEW GROUNDS OF REJECTION WERE NECESSITATED BY
APPLICANT'S AMENDMENT OF THE CLAIMS:**

Art Unit: 1655

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the Applicant regards as his invention.

5. Claims 1, 2, 4-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

- (a) Claims 1, 2 and 4-17 is confusing and indefinite at "type of nucleotides used" in the last step of the claimed method because the meaning of the phrase is unclear and it cannot be determined from the claims or specification what is meant by "type of nucleotides". Clarification is required.

Claim Rejections - 35 USC § 102(b)

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, 4-13 and 16 rejected under 35 U.S.C. 102(b) as being anticipated by Dower et al. (5,547,839, Aug. 20, 1996). Regarding claims 1 and 2, Dower et al. teach a method for sequencing nucleic acid molecules, comprising the steps of: (a) providing at multiple locations, a plurality of nucleic acid molecules wherein the plurality of nucleic acid molecules are single stranded

Art Unit: 1655

or doubled stranded, (col. 14, lines 41 and 42) and have the same sequence as one another (col. 7, lines 58-63) and are able to hybridize to primers in a manner to allow primer extension in the presence of nucleotides and a nucleic acid polymerase, providing each location with a nucleic acid polymerase and a given labeled nucleotide under conditions that allow extension of the primer if a complementary base or if a plurality of bases is present at the appropriate position in the nucleic acid molecules; detecting whether or not said labeled nucleotide has been used for primer extension at each location by determining whether or not the label present on said nucleotide has been incorporated into extended primers and if said nucleotide have been used in primer extension the step further include detecting the nucleotides used per extended primer. Dower et al. also teach wherein the primer extension step comprising multiple labels is repeated and whereby the sequence of the nucleic acid molecule is obtained by referencing to the signal depicted at each location and the identification of of nucleotides used in the primer extension at each location (col. 2, line 66 to col. 4, line 43, *See also col. 23, line 15 to col. 26, line 27*). Additionally Dover et al. disclose wherein the target nucleic acid can be converted into its complementary sequence (col. 14, lines 38-44).

Regarding claim 4, the washing step to remove excess nucleotides is inherent in the primer extension reaction for sequencing the nucleic acid molecules, as this step is routinely practiced in methods of primer extension to alleviate non-specific background noise and increase specificity of detection.

Art Unit: 1655

Regarding claim 5, Dower et al. teach wherein the detection step further comprise the use of absorption or emission spectrometry (col. 12, lines 6-67).

Regarding claim 6, Dower et al. teach wherein both the nucleic acid molecule and primers are immobilized (col. 28, claim 1).

Regarding claims 7-9, Dower et al. teach wherein the method is capable of sequencing hundreds, thousands or even millions of nucleic acid molecules simultaneously wherein the nucleic acid molecules have different sequences (col. 2, line 66-67 to col. 3, lines 1-12) and are sequence at 10 or more different locations such as in e.g. well of a microtiter dish (col. 10, lines 9-30).

Regarding claims 10-13, Dower et al. teach wherein four different nucleotides comprising dATP, dTTP, dGTP and dCTP in labeled form are used in the primer extension reaction (col. 27, line 53) and wherein the four different nucleotides are used in predetermined order in repeated cycles (col. 2, line 66 to col. 4, line 43). Dower et al. additionally teach that the target may be DNA or RNA. Therefore the use of the UTP instead of TTP is inherent in the teaching of Dower et al as this nucleotide along with ATP, GTP and CTP in labeled form would be used in primer extension of RNA nucleic acid molecules.

Regarding claims 16, Dower teach wherein one nucleic acid molecule is provided at each of the locations (col. 10, lines 14-21).

In view of the foregoing, the claimed invention of claims 1, 2, 4-13 and 16 are anticipated by the reference of Dower et al.

Art Unit: 1655

Claim Rejections - 35 USC § 103

8. Claims 15, 17, 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dower et al. in view of Lewin B, (Genes IV, Oxford University Press, New York, December 1990). Regarding claims 15 and 23, Dower et al. teach a method of sequencing nucleic acid molecules at multiple locations wherein the molecules are single stranded or double stranded having the same sequence or different sequences and wherein the method comprise a number steps such that primer extension is used to detect the sequence of the nucleic acid molecules. The sequencing method of Dower et al. differ from that of the claimed invention in that Dower et al. do not expressly teach wherein double stranded nucleic acid molecules having nicks are provided at the multiple locations. Lewin teaches a general method for providing nicks into double stranded nucleic acid molecules by nick translation. Lewin teaches that the method of nick translation for providing nicks into a double stranded nucleic acid molecule is of great practical use for introducing labeled nucleotides into DNA (page 347, col. 2, 5th full paragraph). Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have provided double stranded nucleic acid molecules comprising nicks as taught by Lewin in the primer extension sequencing method of Dower et al. One of ordinary skill in the art would have been motivated to do for the benefit of introducing labeled nucleotides into the nucleic acid molecule for detection.

Regarding claims 17 and 21, the order of combination as described in claims 17 and 21 is not critical to the claimed invention. *In re Burhans*, 69 USPQ 330 states that a selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results.

Art Unit: 1655

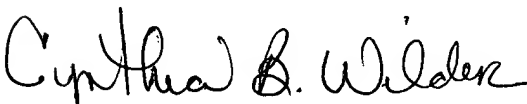
Conclusion

9. No claims are allowed.

10. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Examiner Cynthia Wilder whose telephone number is (703) 305-1680. The Examiner can normally be reached on Monday through Thursday from 7:00 am to 5:00 pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Exr.'s supervisor, W. Gary Jones, can be reached at (703) 308-1152. The official fax phone number for the Group is (703) 308-4242. The unofficial fax number is (703) 308-8724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed the Group's receptionist whose telephone number is (703) 308-0196.



Cynthia B. Wilder, Ph.D.

December 22, 2000



W. Gary Jones
Supervisory Patent Examiner
Technology Center 1600